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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/634,637	08/08/2000	Ken Yamauchi	P108391-00010	4489

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Arent Fox Kintner Plotkin & Kahn PLLC  
Suite 600  
1050 Connecticut Avenue NW  
Washington, DC 20036-5339

EXAMINER

CHAUDRY, MUJTABA M

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 01/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/634,637

Applicant(s)

YAMAUCHI, KEN

Examiner

Mujtaba K Chaudry

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's arguments/amendments with respect to amended claim 3 and previously presented claims 1-2 and 4-11, and newly added claims 12-17 filed October 10, 2003 have been fully considered but are not persuasive. The Examiner would like to point out that this action is made final.

Applicant contends, "... Vos (prior art of record) fails to teach or suggest initializing a path metric calculated based on Viterbi decoding method, at a moment when decoding of one of the data streams is started, if the strength of the noise measure is equal to or greater than the predetermined value." The Examiner disagrees. Vos teaches a data decoder using a dynamically indexed channel state metric to decode symbols recovered from a channel that provides an index value corresponding to a signal strength indication less an average signal strength for a symbol time period, selects a channel metric, corresponding to the index value, from predetermined values, and weights a decoder decision for the symbol time period in accordance with the channel metric. In particular to Applicant's arguments, Vos teaches (col. 1, lines 13-68) the paths may have different path lengths and delays, different path losses, and different incident directions. The different path lengths, specifically path delays and thus phase differences, result in destructive or constructive addition of the incident signals. Different path losses mean different signal powers or amplitudes. Different incident directions mean a slightly different

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signal frequency due to well-known Doppler effects. The net of all these properties is the receiving device will encounter a signal, a composite of all the incident signals, subject to periodic large reductions in signal power (fades) exhibiting rapid phase and small frequency variations during these fades. Vos teaches that various techniques for addressing certain of these various problems have been developed. Among such techniques are encoding the data to be transported to allow for error correction at a decoder. One form of data encoding that has been developed and used is convolutional encoding, wherein the transmitted symbols depend not only on the data to be transported but also on previous data that has been transported. This technique works well in additive white noise situations and is readily adaptable to various specific transport environments. Furthermore an optimum decoder, at least for additive Gaussian noise channels, is readily implemented. This decoder is variously known as a Viterbi or trellis type decoder. Furthermore, Vos teaches (col. 2) a data decoder and method for use therein using a dynamically indexed channel state metric to decode, with improved accuracy, symbols recovered from a signal received over a channel. **The decoder includes a signal strength apparatus for providing a signal strength indication of the signal corresponding to a symbol time period, an averaging apparatus for averaging a plurality of the signal strength indications to provide an average signal strength, an indexing function for generating an index value corresponding to the symbol time period, the index value depending on the signal strength indication and the average signal strength, a metric function for selecting a channel metric corresponding to the index value, and a decision circuit for weighting a decoder decision for the symbol time period in accordance with the channel metric.** Emphasis added.

***Claim Rejections - 35 USC § 103***

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vos (USPN 5363413). See paper No. 4.

As per claims 1, 3, 9, 10, 12, 13, 15 and 17, Vos substantially teaches (title and abstract) a method and apparatus for decoding data in a communications system. Vos teaches (abstract and col. 2, lines 35-48) a Viterbi decoder that includes a signal strength apparatus (analogous to signal-to-noise monitor in the present application) for providing a signal strength indication of the signal corresponding to a symbol time period. Vos teaches (col. 3, lines 53-68—col. 4, lines 1-2) an indexing function that is used to generate an index value that corresponds to each symbol time period and depends on the signal strength and the average signal strength at input. Vos teaches in a preferred embodiment this dependency is a difference between the signal strength indication and the average signal strength provided by a difference circuit (similar functionality of a comparator in the present application) at the output. The difference function compares the signal strength with the average signal strength (or threshold) by computing the

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difference. The index value is made available to a metric function that selects a channel metric (analogous to path metric in the present application) corresponding to the index value. This channel metric/path metric is provided to a decision circuit at input. With reference to figure 2, this is functionally depicted as an indexing switch selecting in accordance with the index value an entry point to the metric function. The decision circuit is arranged for weighting a decoder decision for the symbol time period in accordance with the channel metric at input. Vos teaches figures 4 and 5 convolution codes which have specified coding rates as stated in the present application. Furthermore, referring to figure 2 and col. 3, lines 10-16, Vos teaches the signal at input may include a number of multi-path signals (analogous to a plurality of inputs in the present application), each having symbols representing encoded data modulated thereon, and additive noise due to the channel. Vos does not explicitly teach an initialization signal generation unit to generate an initialization signal that initiates the path metric/channel metric calculated by the Viterbi decoder as stated in the present application. The examiner would like to point out that the initialization of the path metric/channel metric is inherently included within the teachings of Vos since Viterbi decoding algorithm is being utilized. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teachings of Vos by using an initialization unit to initialize the path metric/channel metric based on the Viterbi decoding algorithm. This modification or addition would have been obvious to one of ordinary skill in the art because one of ordinary skill would have recognized that in order to perform the Viterbi decoding algorithm it is necessary for a control signal that would initialize the path metric/channel metric.

As per claims 2, 4-8, 11, 14 and 15, Vos teaches, in view of the above rejections (col. 1, lines 20-68), the different path lengths, specifically path delays and phase differences, that result in destructive or constructive addition of the incident signals. Different path losses mean different signal powers or amplitudes. Different incident directions mean a slightly different signal frequency due to well-known Doppler effects. The net of all these properties is the receiving device will encounter a signal, a composite of all the incident signals, subject to periodic large reductions in signal power exhibiting rapid phase and small frequency variations during these fades. Vos teaches data encoding that has been developed and used is convolutional encoding, wherein the transmitted symbols depend not only on the data to be transported but also on previous data that has been transported, as stated in the present application. This technique is known to work well in additive white noise situations and is readily adaptable to various specific transport environments. Vos teaches in a preferred embodiment, frequency modulation is employed and a frequency discriminator is employed. The examiner would like to point out that frequency modulation includes the data stream to be of BPSK, QPSK or 8PSK as stated in the present application. The examiner would like to point out that the predetermined value or the threshold value taught by Vos is by all means variable since the average of the signal strength will mostly likely vary.

The Examiner disagrees with the Applicant and rejects amended claim 3 and previously presented claims 1-2 and 4-11, and newly added claims 12-17. All arguments have been considered. The Examiner would like to point out that newly added claims 12-17 included limitations similar of those initially presented and therefore are rejected under same prior art as

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well. It is the examiner's conclusion that amended claim 3 and previously presented claims 1-2 and 4-11, and newly added claims 12-17 are not patentably distinct or non-obvious over the prior art of record. See paper No 4.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiries concerning this communication should be directed to the examiner, Mujtaba Chaudry who may be reached at 703-305-7755. The examiner may normally be reached Mon – Thur 7:30 am to 4:30 pm and every other Fri 8:00 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, please contact the examiner's supervisor, Albert DeCady at 703-305-9595. The fax phone number for the organization where this application is assigned is 703-746-7239.



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Any inquiry of general nature or relating to the status of this application or proceeding  
should be directed to the receptionist at 703-305-3900.



Mujtaba Chaudry  
Art Unit 2133  
December 29, 2003



ALBERT DECADY  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100